TRANSPORT OF ENCODED INFORMATION ACROSS A CORE NETWORK

FIELD OF INVENTION

The present invention relates generally to the transport of information between telecommunications nodes. In one aspect, the present invention relates to the transport of encoded information across a core network, and in particular to the transport of encoded information to and from an endpoint in an access network via a core network. The invention is suitable, in one aspect, for use in the transmission of AMR encoded voice information to and from a mobile terminal in third-generation radio access networks across an ATM core network and it will be convenient to hereinafter describe the invention in relation to that exemplary application. It should be appreciated, however, that the invention is not limited to that application, only.

BACKGROUND OF INVENTION

The evolution of mobile communications systems and broadband multi-service networks are generally expected to merge in third-generation mobile systems that will provide global multimedia access to the mobile user. The concept referred to in Europe as the Universal Mobile Telecommunication System (UMTS) and globally as International Mobile Telecommunications in the year 2000 (IMT-2000) includes high-level access to multimedia services and evolution from second-generation mobile systems as key components. Standardization of this new system is carried out mainly by the 3rd Generation Partnership Project (3GPP) and the International Telecommunication Union - Telecommunication Standardization Sector (ITU-T).

UMTS / IMT-2000 separates the access functionality from the core network functionality, providing a common core network to support various types of access networks. Access Networks provide core-network-technology-independent access platforms for mobile terminals to all core networks and network services. In order to support the convergence of fixed and mobile telecommunications networks, a common core network for both fixed and mobile access is envisaged.

Preferably, the first network is an access network. The first network may, for example, be a Public Land Mobile Network PLMN.

Preferably, the first network is a radio access network.

Preferably, the radio access network is a UMTS access network.

Preferably, the message encoding format profile functionality is located in a node of the core network.

Preferably, the node is a UMSC of the core network.

Preferably, the encoded information is AMR codec encoded information.

Preferably, a telecommunication system including the message encoding format profile functionality, further includes a third network based on the first technology, in communication with the second network, and wherein the message encoding format profile functionality is adapted to enable transport of encoded information along at least a portion of a path of communication established between the first and third networks.

In essence, the present invention realises that prior art networks do not provide support for transport of encoded information across core networks when communicating with access networks. In the present invention, it is proposed that the encoded information from an access network is interworked or mapped into the existing core technology transport mechanism by providing a profile functionality between the dissimilar message formats. An advantage of the present invention is that the profile functionality allows for endpoints or nodes separated by a core network to communicate more effectively and negotiate and agree on parameters of communication.

A further aspect of the present invention provides a method of transporting encoded speech information to and from a first endpoint in an access network across an ATM core network, said access network being connected to said core network via first telecommunications node, said method including:

(a) generating an AMR encoded packet at said first endpoint from a digitised speech signal;

(b) transmitting said AMR encoded packet to said first telecommunications node,

(c) mapping the contents of said AMR encoded packet at said first telecommunications node into an ATM Convergence Sublayer Protocol Data Unit; and

(d) transmitting said ATM Convergence Sublayer Protocol Data Units across said core network to said second telecommunications node;

(e) reconstructing said AMR encoded packet from said ATM Convergence Sublayer Protocol Data Unit at a second telecommunications node within or at an interface to said ATM core network.

The ATM Convergence Sublayer Protocol Data Units may be transported across the ATM core network as AAL2 Common Part Sublayer Packets, such as I.366.2 Type 1 packets.

Another aspect of the present invention provides a telecommunications system including:

one or more access networks connected to an ATM core network,

a first endpoint in communication with said core network via said a first of said access networks, and

first and second telecommunications nodes both of which are within or at interfaces to said ATM core network, wherein

said first endpoint acts to generate an AMR encoded packet at said first endpoint from a digitised speech signal and transmits said AMR encoded packet to said first telecommunications node, and wherein

said first telecommunications node acts to map the contents of said AMR encoded packet into an ATM Convergence Sublayer Protocol Data Unit and transmits said ATM Convergence Sublayer Protocol Data Unit across said core network to said second telecommunications node for reconstruction of said AMR encoded packet.

Yet another aspect of the present invention provides a first telecommunications node for use in a telecommunications system including one or more access networks connected to an ATM core network, a first endpoint in communication with said core network via a first of said access networks, and a second telecommunications node, said first and second telecommunications nodes both being within or at interfaces to said ATM core network, wherein said

first endpoint acts to generate an AMR encoded packet from a digitised speech signal and transmits said AMR encoded packet to said first telecommunications node, wherein said first telecommunications node includes:

processing means to map the contents of said AMR encoded packet into an ATM Convergence Sublayer Protocol Data Unit, and

transmission means to transmit said ATM Convergence Sublayer Protocol Data Unit across said core network to said second telecommunications node for reconstruction of said AMR encoded packet from said ATM Convergence Sublayer Protocol Data Unit.

BRIEF DESCRIPTION OF DRAWINGS

The following description refers in more detail to the various features of the present invention. To facilitate an understanding of the invention, reference is made in the description to the accompanying drawings where the invention is illustrated in a preferred, non-limiting embodiment.

In the drawings:

Figure 1 is a schematic diagram illustrating a cellular system including an ATM core network interconnecting fixed and mobile access networks; and

Figure 2 is a schematic diagram showing the structure of a CPS-Packet used to transport AMR encoded information over the ATM core network of Figure 1.

DESCRIPTION OF PREFERRED EMBODIMENT

Referring to Figure 1, there is shown generally a schematic representation of third-generation cellular system 1 including an ATM core network 2 which has two parallel UMTS Terrestrial Radio Access Networks (UTRANs) 3 and 4 linked to it. Additionally, two fixed networks are linked to the ATM core network 2, namely a PTSN/ISDN+ network 5 and an internet/intranet+ network 6. The core network 2 acts to transport information between telecommunications nodes or endpoints forming part of or in communication with any of the networks 3 to 6.

The ATM core network 2 includes at least a first Universal Mobile Telecommunications System Mobile Switching Center (UMSCa) 7 connected to the UTRAN 3 across an interface known as the Iu-interface. The UTRAN 3 includes at least a first Radio Network Controller (RNCa) 8 and Base Stations

(BS) 9 connected to them. Mobile Terminals 10 communicate with the Base Stations 9 across an air interface 11. Similarly, the ATM core network 2 also includes at least a second Universal Mobile Telecommunications System Mobile Switching Center (UMSCb) 12 connected to the UTRAN 4 across an Iu-interface. The UTRAN 4 includes at least a first Radio Network Controller (RNCb) 13 and Base Stations (BS) 14 connected to them. Mobile Terminals 15 communicate with the Base Stations 14 across an air interface 16.

The UMSCa 7 includes processing means 7a for controlling its various functions, including data mapping, reconstruction, manipulation and switching, and transceiving means 7b for transmitting and receiving information to and from other nodes or endpoints in the cellular system 1. The UMSCb 12 similarly includes processing means 12a and transceiving means 12b.

The Base Stations 9 and 14 contain equipment for transmission and reception of information to and from the Mobile Terminals 10 and 15, as well as equipment for encryption/decryption, signal strength measurement and for communication with the Radio Network Controllers 8 and 13. The Radio Network Controllers 8 and 13 set up radio channels for voice and other traffic and for signaling to the UMSCs 7 and 12, and monitor the access network portion of connections established. The UMSCs 7 and 12 serve as an interface to the ATM core network 2 and beyond to other access networks, and control the operation of the Radio Network Controllers 8 and 13.

Each of the Mobile Terminals 10,15 includes an Adaptive Multi-Rate (AMR) Speech Coder-Decoder (Codec) for converting analog speech to and from digital information suitable for transport across a first of the access networks 3 to 6, the ATM core network 2 and finally a second of the access networks 3 to 6.

ADAPTIVE MULTI-RATE (AMR) SPEECH CODER-DECODER (CODEC)

The AMR Speech Codec consists of a multi-rate speech coder, a source controlled rate scheme including a voice activity detector and a comfort noise generation system, and an error concealment mechanism to combat the effects of transmission errors and lost packets. The multi-rate speech coder is a single integrated speech codec with eight source rates from 4.75 kbits/sec to 12.2

kbits/sec, and a low rate background noise encoding mode. The speech coder is capable of switching its bit-rate every 20 ms speech frame upon command.

During operation of the cellular system 1, the speech encoder of one of the Mobile Terminals 10,15 may take its input as a Pulse Coded Modulated (PCM) signal from the audio part of that Mobile Terminal. The AMR encoded speech at the output of the speech encoder is packetised and sent to the UMSCa 7 via the RNCa 8. The AMR codec has eight possible modes of operation in active mode plus one mode of operation in passive mode (comfort noise during silence periods). It outputs a block of bits every 20 ms and can switch between modes on a per frame basis. As indicated in Table 1 below, the number of bits in each block depends on the mode of operation.

AMR Codec Mode	Speech bits	Class A bits	Class B bits	Class C bits
AMR 12.2	244	81	103	60
AMR 10.2	204	65	99	40
AMR 7.95	159	75	84	0
AMR 7.4	148	61	87	0
AMR 6.7	134	55	79	0
AMR 5.9	118	55	63	0
AMR 5.15	103	49	54	0
AMR 4.75	95	39	56	0
Speech Pause (1.8 kbits/s)	35	N/A	N/A	N/A

Table 1 – Block Size for each AMR Mode

The blocks for active modes are divided into three categories, or sub-blocks, of bits (A, B and C) with different relative importance. Class A bits carry most of the encoded information and therefore require high protection. Class B and C bits carry a smaller amount of information and require less or no protection. Corrupted class A sub-blocks are either provided to the decoder in the User Equipment receiving the AMR encoded packet with an indication of their level of

corruption or are discarded. Corrupted class B and C sub-blocks can be passed to the decoder without indication of their level of corruptness.

In the "Speech Pause" mode, the encoder generates three types of frames, namely an SID_First frame, an SID_Update frame or a No_Data frame. The SID_First frame indicates the beginning of a silence period and contains no useful data. The SID_Update frame carries comfort noise, which is calculated over a period of 8 frames (160 ms) and sent every eighth frame. No_Data frames are generated by the AMR encoder during silence periods every 20 ms between SID_Update frames. They contain no useful information and are not transmitted over either of the UTRANs of Figure 1.

TRANSPORT OF AMR ENCODED INFORMATION ACROSS AN ATM CORE NETWORK

The AMR encoded speech is transported to and from one of the Mobile Terminals 10 to one of the Mobile Terminals 15, and vice-versa, across the ATM core network 2. In the example illustrated in Figure 1, the ATM core network 2 uses the ATM Adaptation Layer Type 2 (AAL2) transmission protocol, which provides for bandwidth-efficient transmission of low-rate, short and variable length packets in delay sensitive applications. AAL2 is divided into a Common Part Sub-Layer (CPS) and a Service Specific Convergence Sub-Layer (SSCS). The purpose of the SSCS is to convey narrow-band calls consisting of voice, voiceband data, or circuit mode data as Convergance Sublayer Protocol Data Units. Different SSCSs have been defined to support specific AAL2 user services, or groups of services. One such SSCS is defined in the ITU-T Recommendation I.366.2, otherwise known as I.trunk. ATM Convergence Sublayer Protocol Data Units may be transported across the ATM core network as AAL2 Common Part Sublayer Packets, such as I.366.2 Type 1 packets.

When the AMR encoded speech packet is received at the UMSCa 7 from one of the Mobile Terminals 10, its contents are mapped by the processing means 7a of the UMSCa 7 into an I.366.2 Type 1 packet. An illustration of an I.366.2 Type 1 packet 30 is shown in Figure 2. The I.366.2 Type 1 packet 30 includes a packet header 31 and a payload 32. The payload 32 has a variable

length up to a maximum of 45 octets. The packet header 31 includes a User-to-User Indication (UUI) and a Length Indicator (LI).

A UUI codepoint range of 0-15 is selected for the I.366.2 Type 1 packet 30. Codepoints in this range indicate to nodes within the cellular network 1 that the payload 32 contains encoded audio information. For speech and other audio, the encoding format is an SSCS parameter of operation which must be agreed to between the USMCa 7 and the UMSCb 12 prior to transmission of the I.366.2 Type 1 packet 30.

The particular encoding format used by the UMSCs 7 and 12 for each of the AMR Codec Modes shown in Table 1 is characterised by a predetermined encoding format profile. Encoding format profiles are mappings that inform the receiver of an I.366.2 Type 1 packet 30 how to interpret the packet content. By making reference to the identifiers of these profiles, the UMSCa 7 and the UMSCb 12 can agree on one of the major operating parameters of the SSCS. An exemplary predefined profile referencing explicit packet formats is shown below in Table 2. The table lists standard ETSI-defined AMR Encoding Data Unit (EDU) formats to be used by the UMSCa 7 and the UMSCb 12. Details of the AMR EDU formats have not been included in this description, but are readily available from ETSI Technical Specifications.

UUI Codepoint Range	Packet Length (Octets)	Encoding Format Reference	Description of Encoding Algorithm	M	Packet Time (ms)	Sequence Number Interval (ms)
0-15	31	AMR 12.2 EDU format	AMR 12.2	1	20	20
0-15	26	AMR 10.2 EDU format	AMR 10.2	1	20	20
0-15	21	AMR 7.95 EDU format	AMR 7.95	1	20	20
0-15	19	AMR 7.4 EDU format	AMR 7.4	1	20	20
0-15	18	AMR 6.7 EDU format	AMR 6.7	1	20	20
0-15	16	AMR 5.7 EDU format	AMR 5.9	1	20	20
0-15	14	AMR 5.1 EDU format	AMR 5.15	1	20	20
0-15	13	AMR 4.75 EDU format	AMR 4.75	1	20	20
0-15	2	AMR SID_First EDU format	AMR ID_First[x]	1	-	-
0-15	6	AMR SID_Update EDU format	AMR S50 ID_Update [x]	1	160	160
0-15	1	AMR No_Data EDU format	No-Data	1	20	20

Table 2 – AMR Encoding Format Profile

An AMR EDU is an octet-aligned concatenation of the frames of an AMR audio algorithm entailing a specific format of bits. Every AMR encoded audio packet contains an integral number of EDUs. It will be observed, however, that the size of speech frames of the AMR is not octet aligned for all modes of operation, and for this reason bit stuffing is used in some AMR Codec Modes to achieve octet frame structure for the AMR frame.

The definitions of the profile shown in table 2 includes the following information for each AMR Codec Mode : UUI codepoint range, packet length, reference to the EDU format, description of the algorithm, value of "M" (the

number of service data units in an AMR packet), packet time and sequence number interval.

Upon receipt of the I.366.2 Type 1 packet 30 by the UMSCb 12, the processing means 12a of the UMSCb 12 extracts the AMR encoded speech information from the I.366.2 Type 1 packet by comparison of the payload of the packet 30 with the encoding format profile and detailed bit allocations stored in the UMSCb 12 previously agreed to with the UMSCa 7. The processing means 12b of the UMSCb 12 then reconstructs a corresponding AMR encoded packet for transmission by the transceiving means 12b to the RNCb 13, and ultimately one of the Mobile Terminals 15.

It is to be understood that various modifications and/or additions may be made to the aforementioned method and system without departing from the ambit of the present invention.

For example, the cellular system shown in Figure 1 may include elements of second and/or third generation cellular systems, such as a GSM, D-AMPS, IS-136 or other radio access networks.

Moreover, whilst a Type 2 Adaptation Layer is used in the ATM core network 2 described above, it is envisaged that other types of adaptation layers, and other types of ATM Convergence Sublayer Protocol Data Units, may be used in conjunction with the invention to transport AMR encoded packets across an ATM core network.

CLAIMS

1. In a telecommunication system having a first network based on a first technology and a second network based on a second technology, the second network in communication with the first network;

a message encoding format profile functionality adapted to enable transport of encoded information along at least a portion of a path of communication established between the networks, the profile functionality including:

mapping means for mapping the encoded information from a first message having a first message encoding format to a second message having a second message encoding format wherein the mapping is performed in accordance with the following steps:

a) determining message User-to-User Indication information;

b) determining message Length Indicator information, and;

c) selecting a message encoding format based on the determination of a) and b), above, and;

message creation means for creating the second message having a message encoding format in accordance with the encoding format selected in c).

2. A message encoding format profile functionality as claimed in claim 1, wherein the mapping is based on logical mapping.

3. A message encoding format profile functionality as claimed in claim 2, wherein the logical mapping includes bit stuffing.

4. A message encoding format profile functionality as claimed in claim 1, 2 or 3, wherein the second network is an ATM core network.

5. A message encoding format profile functionality as claimed in claim 4, wherein the ATM network includes an AAL2 Adaptation layer.

6. A message encoding format profile functionality as claimed in claim 5, wherein the AAL2 adaptation layer includes an I.366.2 Service Specific Convergence Sublayer.

7. A message encoding format profile functionality as claimed in any one of the previous claims, wherein the first network is an access network.

8. A message encoding format profile functionality as claimed in claim 7, wherein the first network is a radio access network.

9. A message encoding format profile functionality as claimed in claim 8, wherein the radio access network is a UMTS access network.

10. A message encoding format profile functionality as claimed in claim 7, wherein the first network is a PLMN.

11. A message encoding format profile functionality as claimed in any one of claims 4 to 10, wherein the message encoding format profile functionality is located in a node of the core network.

12. A message encoding format profile functionality as claimed in claim 11, wherein the node is a UMSC of the core network.

13. A message encoding format profile functionality as claimed in any one of the previous claims, wherein the encoded information is AMR codec encoded information.

14. A telecommunication system including the message encoding format profile functionality as claimed in any one of the previous claims.

15. A telecommunication system as claimed in claim 14, further including a third network based on the first technology, in communication with the second

network, and wherein the message encoding format profile functionality is adapted to enable transport of encoded information along at least a portion of a path of communication established between the first and third networks.

16. In a telecommunication system having a first network based on a first technology and a second network based on a second technology, the second network in communication with the first network, a method of providing a message encoding format profile functionality adapted to enable transport of encoded information along at least a portion of a path of communication established between the networks, the method including:

mapping the encoded information from a first message having a first message encoding format to a second message having a second message encoding format wherein the mapping is performed in accordance with the following steps:

a) determining message User-to-User Indication information;

b) determining message Length Indicator information, and;

c) selecting a message encoding format based on the determination of steps a) and b), above.

17. A method as claimed in claim 16, wherein the step of mapping is based on logical mapping.

18. A method as claimed in claim 17, wherein the step of mapping includes bit stuffing.

19. A method of creating a message for use in a telecommunication system as claimed in claim 14 or 15, the method including the steps of:

providing a message encoding format profile functionality in accordance with the method of any one of claims 16 to18, and;

creating the second message having a message encoding format as defined by the encoding format selected in step c).

20. In a telecommunication system having a first network based on a first technology and a second network based on a second technology, the second network in communication with the first network;

a message encoding format profile functionality adapted to enable transport of encoded information along at least a portion of a path of communication established between the networks, the profile functionality including:

mapping means for mapping the encoded information from a first message having a first message encoding format to a second message having a second message encoding format wherein the mapping is performed in accordance with table 2 as herein disclosed.

21. A message encoding format profile functionality as claimed in claim 20, wherein the mapping is based on logical mapping.

22. A message encoding format profile functionality as claimed in claim 20, wherein the logical mapping includes bit stuffing.

23. In a telecommunication system having a first network based on a first technology and a second network based on a second technology, the second network in communication with the first network, a method of providing a message encoding format profile functionality adapted to enable transport of encoded information along at least a portion of a path of communication established between the networks, the method including:

mapping the encoded information from a first message having a first message encoding format to a second message having a second message encoding format wherein the mapping is performed in accordance with table 2 as herein disclosed.

24. A method as claimed in claim 23, wherein the step of mapping is based on logical mapping.

25. A method as claimed in claim 24, wherein the step of mapping includes bit stuffing

26. A method of transporting encoded speech information to and from a first endpoint in an access network across an ATM core network, said access network being connected to said core network via first telecommunications node, said method including:

(a) generating an AMR encoded packet at said first endpoint from a digitised speech signal;

(b) transmitting said AMR encoded packet to said first telecommunications node,

(c) mapping the contents of said AMR encoded packet at said first telecommunications node into an ATM Convergence Sublayer Protocol Data Unit; and

(d) transmitting said ATM Convergence Sublayer Protocol Data Unit across said core network to said second telecommunications node;

(e) reconstructing said AMR encoded packet from said ATM Convergence Sublayer Protocol Data Unit at a second telecommunications node within or at an interface to said ATM core network.

27. A telecommunications system including:

one or more access networks connected to an ATM core network,

a first endpoint in communication with said core network via said a first of said access networks, and

first and second telecommunications nodes both of which are within or at interfaces to said ATM core network, wherein

said first endpoint acts to generate an AMR encoded packet at said first endpoint from a digitised speech signal and transmits said AMR encoded packet to said first telecommunications node, and wherein

said first telecommunications node acts to map the contents of said AMR encoded packet into an ATM Convergence Sublayer Protocol Data Unit and transmits said ATM Convergence Sublayer Protocol Data Unit across said core

network to said second telecommunications node for reconstruction of said AMR encoded packet.

28. A first telecommunications node for use in a telecommunications system including one or more access networks connected to an ATM core network, a first endpoint in communication with said core network via a first of said access networks, and a second telecommunications node, said first and second telecommunications nodes both being within or at interfaces to said ATM core network, wherein said first endpoint acts to generate an AMR encoded packet from a digitised speech signal and transmits said AMR encoded packet to said first telecommunications node, wherein said first telecommunications node includes:

processing means to map the contents of said AMR encoded packet into an ATM Convergence Sublayer Protocol Data Unit, and

transmission means to transmit said ATM Convergence Sublayer Protocol Data Unit across said core network to said second telecommunications node for reconstruction of said AMR encoded packet from said ATM Convergence Sublayer Protocol Data Unit.

29. A system, protocol or device as herein disclosed.

30. A method as herein disclosed.

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(71) Applicant *(for all designated States except US)*: TELEFONAKTIEBOLAGET LM ERICSSON [SE/SE]; S-126 25 Stockholm (SE).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **HOLLIS, Mark, Alan** [AU/AU]; 1 Daintree Avenue, Park Orchards, VIC 3114 (AU). **NOGUERA-RODRIGUEZ, Juan** [ES/AU]; 348 Deakin Street, Essendon, VIC 3040 (AU). **GRAF, Leslie, Gary** [AU/AU]; 3 Hender Court, Balwyn, VIC 3103 (AU). **RYTINA, Ian** [GB/AU]; 30/25 Barkley Street, Carlton, VIC 3053 (AU). **GROVES, Christian, Norman** [AU/AU]; 21 Garden Avenue, Keilor, VIC 3036 (AU). **TERRILL, Stephen, Christopher** [AU/SE]; Hamacker, Flemingatan 45, 4tr. Stockholm (SE).

(74) Agent: **WATERMARK PATENT & TRADEMARK ATTORNEYS**; 290 Burwood Road, Hawthorn, VIC 3122 (AU).

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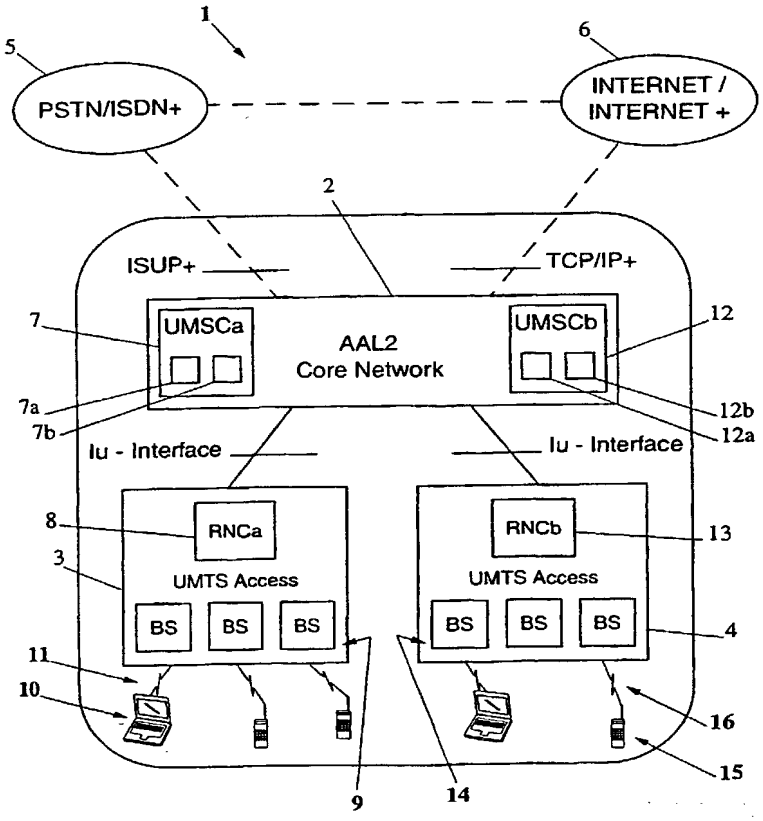
(54) Title: TRANSPORT OF ENCODED INFORMATION ACROSS A CORE NETWORK



(57) Abstract: The present invention relates generally to the transport of information between telecommunications nodes. In one aspect, in a telecommunication system having a first network based on a first technology and a second network based on a second technology, the second network in communication with the first network, the present invention relates to providing a message encoding format profile functionality adapted to enable transport of encoded information along at least a portion of a path of communication established between the networks, including: mapping the encoded information from a first message having a first message encoding format to a second message having a second message encoding format wherein the mapping is performed in accordance with the following steps: a) determining message User-to-User Indication information; b) determining message Length Indicator information, and; c) selecting a message encoding format based on the determination of steps a) and b), above. Preferably, the encoded information is AMR codec encoded information. The invention is suitable, for example, for use in the transmission of AMR encoded voice information to and from a mobile terminal in third-generation radio access networks across an ATM core network.

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For two-letter codes and other abbreviations. refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

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Fig 1.

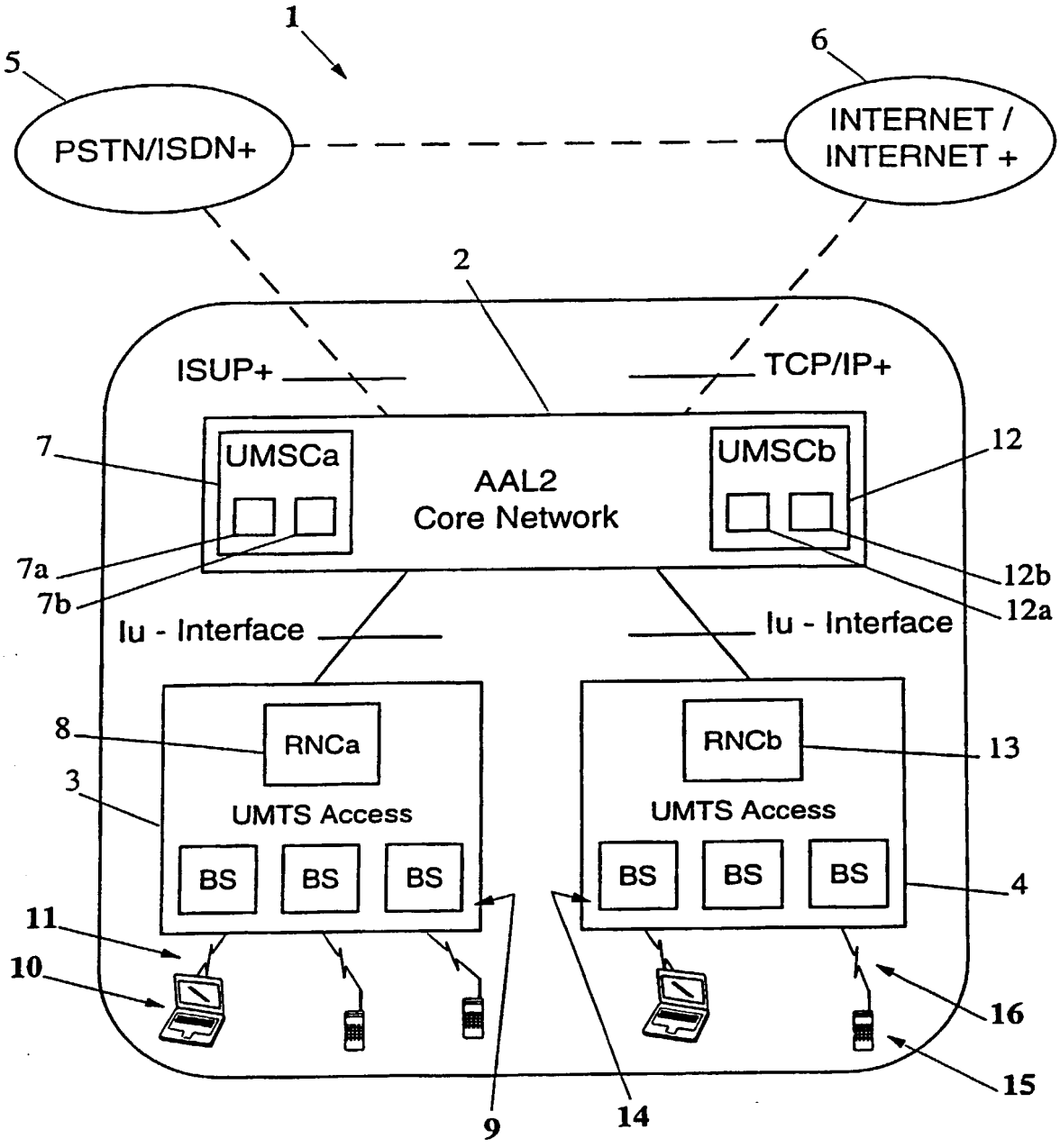
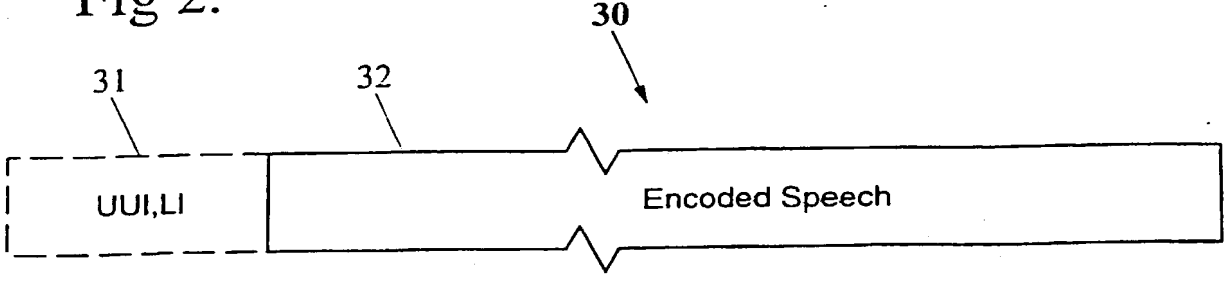


Fig 2.



PATENT APPLICATION
DOCKET NO.: _____

RULES 63 AND 67 (37 C.F.R. 1.63 and 1.67)
DECLARATION AND POWER OF ATTORNEY

FOR UTILITY/DESIGN/CIP/PCT NATIONAL APPLICATIONS

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name; and

I believe that I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

Transport of Encoded Information Across a Core Network

_____, the specification of which: (mark only one)

_____ (a) is attached hereto.

_____ (b) was filed on _____ as Application Serial No. _____ and was amended on _____ (if applicable)

x (c) was filed as PCT International Application No. PCT/ AU00/01170 on 27 September, 2000 and was amended on _____ (if applicable).

_____ (d) was filed on _____ as Application Serial No. _____ and was issued a Notice of Allowance on _____.

_____ (e) was filed on _____ and bearing attorney docket number _____.

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims as amended by any amendment referred to above or as allowed as indicated above.

I acknowledge the duty to disclose all information known to me to be material to the patentability of this application as defined in 37 CFR § 1.56. If this is a continuation-in-part (CIP) application, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of 35 U.S.C. § 112, I acknowledge the duty to disclose to the Office all information known to me to be material to patentability of the

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I hereby claim foreign priority benefits under 35 U.S.C. § 119/365 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate filed by me or my assignee disclosing the subject matter claimed in this application and having a filing date (1) before that of the application on which my priority is claimed or, (2) if no priority is claimed, before the filing date of this application:

PRIOR FOREIGN PATENTS

Number	Country	Month/Day/Year Filed	Date first laid-open or Published	Date patented or Granted	Priority Claimed Yes	No
PQ3190	AU	Oct, 01, 1999			yes	

I hereby claim the benefit under 35 U.S.C. § 120/365 of any United States application(s) listed below and PCT international applications listed above or below:

PRIOR U.S. OR PCT APPLICATIONS

Application No. (series code/serial no.) Month/Day/Year Filed
Status(pending, abandoned, patented)

I hereby appoint:

TIMOTHY G. ACKERMANN, Reg. No. 44,493
THOMAS E. ANDERSON, Reg. No. 37,063
BENJAMIN J. BAI, Reg. No. 43,481
MICHAEL J. BLANKSTEIN, Reg. No. 37,097
MARY JO BOLDINGH, Reg. No. 34,713
MARGARET A. BOULWARE, Reg. No. 28,708
ARTHUR J. BRADY, Reg. No. 42,356
MATTHEW O. BRADY, Reg. No. 44,554
DANIEL J. BURNHAM, Reg. No. 39,618
THOMAS L. CANTRELL, Reg. No. 20,849
RONALD B. COOLLEY, Reg. No. 27,187
THOMAS L. CRISMAN, Reg. No. 24,846
STUART D. DWORK, Reg. No. 31,103
WILLIAM F. ESSER, Reg. No. 38,053
ROGER J. FRENCH, Reg. No. 27,786
JANET M. GARETTO, Reg. No. 42,568
JOHN C. GATZ, Reg. No. 41,774
RUSSELL J. GENET, Reg. No. 42,571
J. KEVIN GRAY, Reg. No. 37,141
STEVEN R. GREENFIELD, Reg. No. 38,166
J. PAT HEPTIG, Reg. No. 40,643
SHARON A. ISRAEL, Reg. No. 41,867
JOHN R. KIRK JR., Reg. No. 24,477
PAUL R. KITCH, Reg. No. 38,206
TIMOTHY M. KOWALSKI, Reg. No. 44,192
HSIN-WEI LUANG, Reg. No. 44,213
JAMES F. LEA III, Reg. No. 41,143
ROBERT W. MASON, Reg. No. 42,848
ROGER L. MAXWELL, Reg. No. 31,855
ROBERT A. McFALL, Reg. No. 28,968
STEVEN T. McDONALD, Reg. No. 45,999
LISA H. MEYERHOFF, Reg. No. 36,869
STANLEY R. MOORE, Reg. No. 26,958
RICHARD J. MOURA, Reg. No. 34,883
MARK V. MULLER, Reg. No. 37,509
P. WESTON MUSSELMAN JR. Reg No. 31,644
DANIEL G. NGUYEN, Reg. No. 42,933

55

SPENCER C. PATTERSON, Reg. No. 43,849

RUSSELL N. RIPPAMONTI, Reg. No. 39,521
STEPHEN G. RUDISILL,, Reg. No. 20,087
HOLLY L. RUDNICK, Reg. No. 43,065
J.L. JENNIE SALAZAR, Reg. No. 45,065
KEITH W. SAUNDERS, Reg. No. 41,462
JERRY R. SELINGER, Reg. No. 26,582
GARY B. SOLOMON, Reg. No. 44,347
WAYNE O. STACY, Reg. No. 45,125
STEVE Z. SZCZEPANSKI, Reg. No. 27,957
ANDRE M. SZUWALSKI, Reg. No. 35,701
ALAN R. THIELE, Reg. No. 30,694
TAMSEN VALOIR, Reg. No. 41,417
RAYMOND VAN DYKE, Reg. No. 34,746
BRIAN D. WALKER, Reg. No. 37,751
GERALD T. WELCH, Reg. No. 30,332
HAROLD N. WELLS, Reg. No. 26,044
WILLIAM D. WIESE, Reg. No. 45,217

all of the firm of **JENKENS & GILCHRIST, P.C.**, 3200 Fountain Place, 1445 Ross Avenue, Dallas, Texas 75202-2799, as my attorneys and/or agents, with full power of substitution and revocation, to prosecute this application, provisionals thereof, continuations, continuations-in-part, divisionals, appeals, reissues, substitutions, and extensions thereof and to transact all business in the United States Patent and Trademark Office connected therewith, to appoint any individuals under an associate power of attorney and to file and prosecute any international patent application filed thereon before any international authorities, and I hereby authorize them to act and rely on instructions from and communicate directly with the person/assignee/attorney/firm/organization who/which first sent this case to them and by whom/which I hereby declare that I have consented after full disclosure to be represented unless/until I instruct them in writing to the contrary.

Please address all correspondence and direct all telephone calls to:

Stanley R. Moore
Jenkens & Gilchrist, P.C.
3200 Fountain Place
1445 Ross Avenue
Dallas, Texas 75202-2799
214/855-4500 214/855-4300 (fax)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

NAMED INVENTOR(S)

Mark Alan Hollis	X	6/3/2002
Full Name	**Inventor's Signature**	**Date**

100

Park Orchards, Victoria, Australia AUX

Residence (city, state, country)

Citizenship Australian

1 Daintree Avenue, Park Orchards, Victoria 3114. Australia.
Post Office Address (include zip code)

Juan Noguera-Rodriguez		25-03-2002
Full Name	**Inventor's Signature**	**Date**

2nd

Bromma, Sweden SEX
Residence (city, state, country) **Citizenship** Spanish

Faltmarkskalksvagen 16, 16732, Bromma. Sweden.
Post Office Address (include zip code)

Leslie Gary Graf		6/3/2002
Full Name	**Inventor's Signature**	**Date**

3rd

Balwyn. Victoria. Australia AUX
Residence (city, state, country) **Citizenship** Australian

3 Hender Court, Balwyn. Victoria 3103. Australia.
Post Office Address (include zip code)

Ian Rytina		6/3/2002
Full Name	**Inventor's Signature**	**Date**

4th

Carlton. Victoria 3053. Australia AUX
Residence (city, state, country) **Citizenship** British

62 Carlton Street, Carlton. Victoria 3053. Australia.
Post Office Address (include zip code)

Christian Norman Groves		6/3/2002
Full Name	**Inventor's Signature**	**Date**

5th

Newport. Victoria. Australia AUX
Residence (city, state, country) **Citizenship** Australian

	48 Percy Street, Newport. Victoria 3015. Australia. **Post Office Address** (include zip code)		
60	Stephen Terrill **Full Name**	Stephen Terrill **Inventor's Signature**	18/3/2002 **Date**
	Flemingatan, Stockholm. Sweden. SEX **Residence** (city, state, country)	**Citizenship** Australia	
	Hamacker, Flemingatan 45, 4tr. S-112. 32 Stockholm. Sweden. **Post Office Address** (include zip code)		